

## CLAIMS

- 1) An intermediate node for controlling the treatment of data in a data network, the data network comprising said intermediate node, at least one upstream node, and a plurality of downstream nodes, the or one of the upstream nodes being arranged to provide data to said intermediate node, the or one of the upstream nodes being arranged to provide path characterisation information to said intermediate node, and said downstream nodes being arranged to receive data via paths downstream from the intermediate node; said intermediate node comprising:
  - 10 means for receiving data from an upstream node;
  - means for receiving path characterisation information from an upstream node, and for deriving therefrom information indicative of a characteristic of a path downstream of said intermediate node;
  - means arranged to select, in dependence on said information indicative of said characteristic of a downstream path, a preferred manner of treatment for data to be forwarded on a downstream path; and
  - means for forwarding data to a downstream node according to said preferred manner.
- 20 2) An intermediate node according to claim 1, wherein the selection of a preferred manner of treatment for data to be forwarded on a downstream path relates to selection of a preferred downstream path.
- 25 3) An intermediate node according to claim 1 or 2, wherein the selection of a preferred manner of treatment for data to be forwarded on a downstream path relates to selection of one or more of the following:
  - (i) traffic engineering;
  - (ii) route advert verification;
  - (iii) contract verification;
  - 30 (iv) differentiated service gateways.
- 4) An intermediate node according to any of the preceding claims, wherein the data provided to said intermediate node comprises said path characterisation information.

- 5) An intermediate node according to any of the preceding claims, the data network comprising a data channel for the forwarding of data between nodes and a control channel for providing path characterisation information to the intermediate node, wherein the upstream node arranged to provide data to said intermediate node is a node of the data channel, and the upstream node arranged to provide path characterisation information to said intermediate node is a node of the control channel.
- 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300 305 310 315 320 325 330 335 340 345 350 355 360 365 370 375 380 385 390 395 400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 475 480 485 490 495 500 505 510 515 520 525 530 535 540 545 550 555 560 565 570 575 580 585 590 595 600 605 610 615 620 625 630 635 640 645 650 655 660 665 670 675 680 685 690 695 700 705 710 715 720 725 730 735 740 745 750 755 760 765 770 775 780 785 790 795 800 805 810 815 820 825 830 835 840 845 850 855 860 865 870 875 880 885 890 895 900 905
- 6) An intermediate node according to any of the preceding claims, wherein the intermediate node shares computational resources with an upstream or a downstream node.
- 7) A controlling intermediate node for controlling the treatment of data in a data network also comprising a provider node, a receiver node, and at least one other intermediate node, the provider node being arranged to provide data and path characterisation information to at least one of said intermediate nodes or to the receiver node, said other intermediate node or nodes being arranged to receive data and forward data and path characterisation information to at least a further intermediate node or to the receiver node, and the receiver node being arranged to receive data from at least one intermediate node or from the provider node; said controlling intermediate node comprising:
  - means for receiving data from the provider node or from an intermediate node upstream of said controlling intermediate node;
  - means for receiving path characterisation information from said provider node or from an intermediate node upstream of said controlling intermediate node, and for deriving therefrom information indicative of a characteristic of a path downstream of said controlling intermediate node;
  - means arranged to select, in dependence on said information indicative of said characteristic of a downstream path, a preferred node from a set of nodes including said other intermediate node or nodes and the receiver node; and
  - means for forwarding data to said preferred node.
- 8) A method for controlling the treatment of data to be forwarded from an intermediate node in a data network, the data network comprising said intermediate node, at least one upstream node, and a plurality of downstream nodes, the or one of the upstream nodes being arranged to provide data to said intermediate node, the or one of

the upstream nodes being arranged to provide path characterisation information to said intermediate node, and said downstream nodes being arranged to receive data via paths downstream from the intermediate node; said method comprising the steps of:

- receiving data from an upstream node;
- 5 receiving path characterisation information from an upstream node, and deriving therefrom information indicative of a characteristic of a path downstream of said intermediate node;
- selecting, on the basis of said information indicative of said characteristic of a downstream path, a preferred manner of treatment for data to be forwarded on a
- 10 downstream path; and
- forwarding data to a downstream node according to said preferred manner.

9) A method according to claim 8, wherein the step of selecting a preferred manner of treatment for data to be forwarded on a downstream path relates to selecting a  
15 preferred downstream path.

10) A method according to claim 8 or 9, wherein the step of selecting a preferred manner of treatment for data to be forwarded on a downstream path relates to selection of one or more of the following:

- 20 (i) traffic engineering;
- (ii) route advert verification;
- (iii) contract verification;
- (iv) differentiated service gateways.

25 11) A method according to any of claims 8 to 10, wherein the data provided to said intermediate node comprises said path characterisation information.

12) A method according to any of claims 8 to 11, the data network comprising a data channel for the forwarding of data between nodes and a control channel for providing path  
30 characterisation information to the intermediate node, wherein the upstream node arranged to provide data to said intermediate node is a node of the data channel, and the upstream node arranged to provide path characterisation information to said intermediate node is a node of the control channel.

- 13) A method according to any of claims 8 to 12, wherein the intermediate node shares computational resources with an upstream or a downstream node.
- 14) A method for controlling the treatment of data to be forwarded from a controlling intermediate node in a data network, said data network also comprising a provider node, a receiver node, and at least one other intermediate node, the provider node being arranged to provide data to at least one of said intermediate nodes or to the receiver node, said intermediate nodes being arranged to receive data and forward data to at least a further intermediate node or to the receiver node, and the receiver node being arranged to receive data from at least one intermediate node or from the provider node; said method comprising steps of:
  - receiving data from the provider node or from an intermediate node upstream of said controlling intermediate node;
  - receiving path characterisation information from said provider node or from an upstream intermediate node, and deriving therefrom information indicative of a characteristic of a downstream path;
  - selecting, on the basis of said information indicative of said characteristic of a downstream path, a preferred node from a set of nodes including said other intermediate node or nodes and the receiver node; and
- 20 forwarding data to said preferred node.